

## REMARKS

Claims 1, 5-8, 13-23, 25, 26, and 28-40 are pending in the application. Claims 1, 13, 20, 23, 29, 33, 36, and 39 are independent. By the forgoing Amendment, Applicants have amended claims 1, 23, 26, 29, and 40, and have canceled claims 11-12, 24, and 27. These changes are believed to introduce no new matter and their entry is respectfully requested.

### Objection to Claim 40

In paragraph 3 of the Office Action, the Examiner objected to claim 40 as being of improper dependent form. By the foregoing Amendment, Applicants have amended claim 40 to accommodate the Examiner. Accordingly, Applicants respectfully request that the Examiner reconsider and remove the objection to claim 40.

### Rejection of Claims 1, 5-8, 11-22, and 29-40 Under 35 U.S.C. §101

In paragraph 4 of the Office Action, the Examiner rejected claims 1, 5-8, 11-22, and 29-40 under 35 U.S.C. §101 as being directed to non-statutory subject matter. In particular, the Examiner states that “signals per se are not statutory subject matter, have no tangible physical structure, and do not perform any useful, concrete, and tangible result” and “[w]ith respect to claim 1, the method/article of manufacture machine operation does not produce a tangible result. It is unclear how the result is being stored, displayed, or used in any tangible manner.” Applicants respectfully traverse the rejection.

MPEP §2106.II.A acknowledges that courts have not yet defined the terms useful, concrete, and tangible in the context of the practical application requirement for purposes of examination of patent applications for compliance with 35 U.S.C. §101. However, MPEP §2106.II.A offers at least one example of a claimed invention that has a practical application because it produces useful, concrete, and tangible result. For instance “[c]laims drawn to a long-distance telephone billing process containing mathematical algorithms were held to be directed to patentable subject matter because ‘the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle.’ *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358, 50 USPQ2d 1447,

1452 (Fed. Cir. 1999); - ‘**[T]ransformation of data**, representing discrete dollar amounts, **by a machine** through a series of mathematical calculations into a final share price, **constitutes a practical application** of a mathematical algorithm, formula, or calculation, **because it produces ‘a useful, concrete and tangible result’** -- a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.’ *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601” (emphasis added).

Applicants respectfully submit that embodiments of the claimed invention are analogues to the above scenario. For example, Applicants respectfully submit that embodiments of the claimed invention apply a wavelet to produce a useful, concrete, tangible result without preempting other uses of wavelets. Also, application of the wavelet transforms a radio frequency (RF) signal that is being tested into at least one timing parameter. Such transformation constitutes a practical application of the wavelet because it produces a useful, concrete, tangible result, to wit: at least one timing parameter from the RF signal that may be used for display or to characterize the RF signal.

Applicants are not clear as to whether the Examiner is asserting that the claimed invention fails to **recite** how the result is being stored, displayed, or used in any tangible manner. In any event, Applicants respectfully submit that MPEP §2106.II provides that, in view of *In re Abele*, 684 F.2d 902, 907, 214 USPQ 682, 687 and *Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992).), Examiners should begin examination by reviewing the complete specification, including the **detailed description** of the invention, any specific embodiments that have been disclosed, the claims, and any specific, substantial, and credible **utilities** that have been asserted for the invention. In light of this, Applicants respectfully direct the Examiner to paragraph [0030] (“Embodiments of the present invention apply wavelets to radio frequency (RF) signals such as telecommunication serial data streams and computer clock signals to extract specific characteristics (e.g., jitter, phase variations, frequency variations) so that their timing, phase, and frequency components can be characterized”) and to paragraph [0003] (accurate estimation of parameters such as signal period, frequency, phase, jitter, edges rates (rise and fall times), etc., is essential for designing such systems as well as for characterizing their operation). That is, at least one described credible

utility for the claimed invention is characterization of timing parameters to facilitate design of computer and/or telecommunication systems. Applicants therefore respectfully submit that the subject matter of the claimed invention is statutory subject matter and respectfully request that the Examiner reconsider and remove the rejection to claims 1, 5-8, 11-22, and 29-40.

Rejection of Claims 1, 5-8, 23, and 29-32 Under 35 U.S.C. §102(b)

In paragraph 4 of the Office Action, the Examiner rejected claims 1, 5-8, 23, and 29-32 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,937,646 B1 to McCorkle (hereinafter “McCorkle”). A claim is anticipated only if each and every element of the claim is found, either expressly or inherently, in a reference. (MPEP §2131 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987)). The identical invention must be shown in as complete detail as is contained in the claim. *Id. citing Richardson v. Suzuki Motor Co.*, 868 F.2d 1226,1236 (Fed. Cir. 1989)). Applicants respectfully traverse the rejection.

Amended claims 1 and 29 recite in pertinent part “applying ***a discrete Haar wavelet or a discrete Morlet wavelet*** to a radio frequency (RF) signal under test” (emphasis added). Support for these changes can be found in original claims 11 and 12. Amended claim 23 recites in pertinent part “a wavelet tool coupled to apply ***a discrete Haar wavelet or a discrete Morlet wavelet*** to the RF signal” (emphasis added). Support for these changes can be found in original claims 24 and 27.

Applicants respectfully submit that McCorkle is not properly applied to the claimed invention. McCorkle appears to be directed to Code Division Multiple Access (CDMA) multiplexing in a transmission system. As is known in CDMA parlance, a “bit” refers to a payload binary digit transmitted over the communications link, a “chip” refers to a sequence of binary digits transmitted over the communications link, and a bit includes multiple chips. McCorkle defines a sequence of wavelets as “chips” representing a logical “1” code or a logical “0” code. McCorkle does not address characterizing RF signals using either Haar or Morlet wavelets but is concerned with CDMA communications and thus uses different definition for wavelets that is not consistent with a Haar or Morlet wavelet.

Assuming for the sake of argument that McCorkle is properly applied to the claimed invention, Applicants respectfully submits that McCorkle fails to show the identical invention as that of the claimed invention. For example, McCorkle fails to teach a discrete Haar wavelet and/or a discrete Morlet wavelet. As discussed above, this is because McCorkle is not concerned with characterizing RF signals using either Haar or Morlet wavelets but is concerned with CDMA communications. Because McCorkle is not properly applied to and/or fails to teach the identical invention as recited in the claimed invention, Applicants respectfully submit that claims 1, 23, and 29 are patentable over McCorkle.

Claims 5-8 properly depend from claim 1, which Applicants respectfully submit is patentable, and claims 30-32 properly depend from claim 29, which Applicants respectfully submit is patentable. Accordingly, Applicant respectfully submits that claims 5-8 and 30-32 are patentable for at least the same reasons that claims 1 and 29, respectively, are patentable. (MPEP §2143.03 (citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 988))). Accordingly, Applicant respectfully requests that the Examiner reconsider and remove the rejection to claims 1, 5-8, 23, and 29-32.

Rejection of Claims 1, 5-8, 23, and 29-32 Under 35 U.S.C. §103(a)

In the Office Action, the Examiner rejected claims 1, 5-8, 23, and 29-32 under 35 U.S.C. § 102(b) as being obvious over U.S. Patent No. 6,175,811 to Tekinay (hereinafter “Tekinay”) in view of McCorkle. To establish a *prima facie* case of obviousness, an Examiner must show that there is some suggestion or motivation to modify a reference to arrive at the claimed invention, that there is some expectation of success, and that the cited reference teaches each and every element of the claimed invention. (MPEP §2143.) Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, an Examiner must show that the references teach or suggest each and every element of the claimed invention. (MPEP §2143.) Any motivation to combine reference teachings must be found in the prior art of record. For example, an Examiner may find the suggestion or motivation to combine teachings in a reference (e.g., a U.S. Patent, inherency), in common knowledge in the art (i.e., well-known art), in established scientific principles, in art-recognized equivalents, or in legal precedent (e.g.,

admitted prior art). However an Examiner may not use an improper rationale for combining reference teachings. (MPEP §2145.) One such impermissible rationale is that if the proposed modification or combination of references would change the principle of operation of the references, then such combination or modification may not be used to render the claimed invention obvious. MPEP §2143.01 (citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)).

In the Office Action, the Examiner states that Tekinay teaches applying a wavelet representation of an RF signal under test and extracting parameters from the RF signal using the wavelet transform of the RF signal. The Examiner concedes that Tekinay fails to disclose that a timing parameter includes a clock period of the RF signal, but cites McCorkle for teaching a wavelet having a timing parameter with a clock period. The Examiner then combines McCorkle with Tekinay asserting that it would have obvious to modify Tekinay with the clock period of McCorkle to “identify the parameter corresponding of the wavelet in RF signal.”

Applicants respectfully submit that modifying Tekinay with McCorkle as the Examiner proposes would change the principle of operation of either Tekinay or McCorkle. This is because the term “wavelet” as used in McCorkle is not equivalent to the term “wavelet” as used in Tekinay. The term “wavelet” in Tekinay refers to a representation of a signal in terms of a finite length or fast decaying oscillating waveform for purposes of analysis of the signal. The term “wavelet” in McCorkle refers to a chip used in CDMA communications. If the wavelet of Tekinay were used in place of the wavelet or CDMA chip of McCorkle, the CDMA system of McCorkle would not function properly. Likewise, if the wavelet or CDMA chip of McCorkle were used in place of the wavelet of Tekinay, the method of Tekinay would not function properly. Because the modification of Tekinay with McCorkle as proposed by the Examiner would change the principle of operation of either Tekinay or McCorkle, Applicants respectfully submit that the Examiner has not made out a *prima facie* case of obviousness over the claimed invention and respectfully request that the Examiner reconsider and remove the rejection to claims 1, 5-8, 23, and 29-32.

Rejection of Claims 11-12 and 24-28 Under 35 U.S.C. §103(a)

In paragraph 6 of the Office Action, the Examiner rejected claims 11-12 and 24-28 as being obvious over Tekinay in view of McCorkle in further view of Wavelet-Wikipedia. Applicants respectfully traverse the rejection.

Applicants reiterate that Tekinay and McCorkle cannot be properly combined to reject claims of the present application based on obviousness because the modification of Tekinay with McCorkle as proposed by the Examiner would change the principle of operation of either Tekinay or McCorkle. Also, by the foregoing Amendment, claims 11-12, 24, and 27 have been canceled, rendering the rejection to them moot. Claims 25-26 properly depend from claim 23, which Applicants respectfully submit is patentable. Accordingly, Applicant respectfully submits that claims 25-26 are patentable for at least the same reasons that claim 23 are patentable. (MPEP §2143.03 (citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988))). Accordingly, Applicant respectfully requests that the Examiner reconsider and remove the rejection to claims 11-12 and 24-28.

### CONCLUSION

Applicants submit that all grounds for rejection have been properly traversed, accommodated, or rendered moot and that the application is in condition for allowance. The Examiner is invited to telephone the undersigned representative if the Examiner believes that an interview might be useful for any reason.

Respectfully submitted,  
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